

B.E. DEGREE EXAMINATIONS: NOV/DEC 2012

Third Semester

EEE261: ELECTRICAL MACHINES AND POWER SYSTEMS

(Common to ECE/EIE)

Time: Three Hours

Maximum Marks: 100

Answer All Questions:-

PART A (10 x 1 = 10 Marks)

1. The critical resistance of the DC generator is the resistance of
a) armature b) field c) load d) brushes
2. Lap winding is suitable for _____ current, _____ voltage DC generators
a) high, low b) low, high c) low, low d) high, high
3. A transformer having 1000 primary turns is connected to 250 V AC supply. For a secondary voltage of 400 V, the number of secondary turns should be
a) 1600 b) 250 c) 400 d) 1250
4. A transformer has negative voltage regulation when its load power factor is
a) Zero b) Unity c) Leading d) Lagging
5. The frequency of rotor current in a 6 pole, 50 Hz, 3 phase induction motor running at 950 rpm is _____ Hz
a) 2.5 b) 1.5 c) 5.0 d) 0.05
6. The starting winding of single phase induction motor is placed in the
a) rotor b) Stator c) armature d) field
7. Turbo alternators speed range from _____ RPM
a) 1000-2000 b) 0-1500 c) 1500-3000 d) 100-500
8. The application of stepper motor is
a) Robotics b) Lifts c) Cranes d) Lathe
9. The cables between distributors and actual consumer premises is called
a) Feeders b) Service mains c) Distributors d) Substation
10. The pin type insulators are restricted up to _____
a) 11 KV b) 33 KV c) 66 KV d) 200 KV

PART B (10 x 2 = 20 Marks)

11. What is armature reaction, what are its effects and how to overcome it?
12. Write the Back EMF and torque equations of DC motor
13. Why transformer rating is in KVA?
14. Distinguish between core and shell type transformers
15. Why single phase induction motors are not self starting?
16. Why external resistance cannot be added in squirrel cage induction motor?
17. Differentiate between salient and non salient type rotors of alternator
18. Give the applications of stepper motor
19. What is corona effect and what are its effects?
20. Define String efficiency with its formula.

PART C (5 x 14 =70 Marks)

21. a) (i) Explain the construction of DC machine with neat sketches. (7)
(ii) Explain the characteristics of series generator. (7)
(OR)
b) (i) What is the necessity of a starter in a DC motor? Explain any one type of the starter in detail? (7)
(ii) Explain the Swinburne's test with neat sketches. (7)
22. a) Explain the OC and SC tests in transformer with circuit diagram, tabulation and calculations.
(OR)
b) (i) Discuss with neat sketches the constructional features and working principle of Transformer. (7)
(ii) Deduce the Equivalent circuit of transformer. (7)
23. a) Explain the auto transformer and star delta starter with neat sketches.
(OR)
b) With neat circuit and phasor diagrams explain split phase induction machine and capacitor start 1 phase induction machine.

24. a) (i) Derive the EMF equation of an alternator. (7)
(ii) A 1500 KVA, 6600 V, 3Ø star connected alternator has a resistance of 0.6Ω per phase and synchronous reactance of 5Ω per phase. Calculate the full load regulation at 0.8 power factor lag and lead. (7)

(OR)

- b) (i) With neat sketch explain the operation of variable reluctance stepper motor. (10)
(ii) Explain the working principle of Hysteresis motor. (4)

25. a) (i) Explain the types of HVDC links with neat sketches. (10)
(ii) Compare overhead and underground transmission system. (4)

(OR)

- b) (i) What is need for insulators? Explain the different types of insulators with neat sketches. (10)
(ii) What are the different parts of cables? Draw and explain. (4)
